Jordan Lake
Water Supply Allocation
Application

Alternatives Evaluation

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V. Alternate Water Supplies

- Compete a table for each alternative that could meet future demands
- Describe each alternative
- Locations of SW withdrawals/discharges

Alternative Description

Future Supply Alternative List the components of each alternative scenario including the planning period when each component will come online.

(Alternative #X)	2010	2015	2020	2025	2030	2035	2040	2050	2060		Build Out
(1) Line (15) from Table 8-A "Existing Supply – Demand"											
(2) Available supply from Project 1 (describe)											
Available supply from Project 2 (describe)											
Available supply from Project 3 (describe)											
(3) Supply available for future needs [(1) + (2)]											
(4) Total discharge to Source Basin											
(5) Consumptive Use in Source Basin											
(6) Total discharge to Receiving Basin											
(7) Consumptive Use in Receiving Basin											
(8) Amount not returned to Source Basin [(6) + (7)]											

List details of the future supply options included in this alternative in the table below.

Future Source or Facility Name	PWSID (if purchase)	Surface water or Ground water	Sub-Basin of Source	Water Quality Classification	Additional Supply (MGD)	Development Time years	Year Online

Alternative Comparisons

- Costs (planning estimates)
- Capital Costs
  - Design & Construction
  - Land acquisition
  - Facilities and Equipment
- Operation and Management
- Contingency

Contingency	Project Is: Not Complex or Complex	Project Is: Very Complex
Engineering Costs	.10	.20
Legal & Administrative Costs	.05	.10
Cost of Regulatory Requirements	.05	.10
General Contingency	.10	.10

Alternative Comparisons

- Technical Complexity
  - Not Complex, Complex, Very Complex
- Institutional Complexity
  - Not Complex, Complex, Very Complex
- Political Complexity
  - Not Complex, Complex, Very Complex
- Public Benefits
  - in addition to water supply
- Justify Responses

Environmental Impacts

- The applicant will estimate the environmental impacts of any project, and compare them with the environmental impacts associated with developing a Jordan Lake water supply. The applicant should consider only direct environmental impacts. The applicant will summarize the expected environmental impacts of each project as either *Worse*, *Same*, or *Better* than a Jordan Lake water supply.

Available Supply

- The applicant must determine the available supply for each alternative using the same methodology as presented in Section III.

Alternatives with IBT

- Applicants will present any alternative that involves an interbasin transfer with at least two variations of that alternative; one variation with the necessary facilities to return treated wastewater to the source basin, and one variation without returning water to the source basin.

Development Time

- The timeliness of a given project may justify its inclusion or exclusion from a set of projects for a given alternative. The timeliness of a given project may also justify its order within a set of projects for a given alternative.

Surface Water Transfers

- The applicant will estimate the quantity of water (in MGD on a maximum day basis) that will be subject to the Regulation of Surface Water Transfers Act (interbasin transfer) for each alternative. The applicant will estimate the quantity transferred between a source basin and receiving basin based on the projected demand for that period and the applicant's projected service area relative to the basin boundary. The applicant will estimate the consumptive losses in each sub-basin within the system's service area. The applicant will use a maximum/average day demand factor based on their LWSP Update. The applicant will calculate the interbasin transfer

Technical Complexity

- The applicant will discuss the relative technical complexity of implementing each project. The applicant will summarize the technical complexity of each project as either *Not Complex*, *Complex*, or *Very Complex* and generally justify the rating. For example, a project limited to building a transmission line to convey purchased water might be rated “not complex,” while a project to build a new reservoir might be “very complex.”

Institutional Complexity

- The applicant will discuss the relative institutional complexity of implementing each project. The applicant will consider current and anticipated statutory and regulatory constraints, including such issues as water supply reclassification and environmental review requirements. The applicant will summarize the institutional complexity of each project as either *Not Complex*, *Complex*, or *Very Complex* and generally justify the rating. For example, expanding a water supply intake up to an already permitted capacity might be rated "not complex," while a new water supply source that requires reclassification or an Interbasin Transfer Certificate might be rated "very complex."

Political Complexity

- The applicant will discuss the relative political complexity of implementing each project. The applicant will consider such issues as the likely acceptance by publicly elected officials and anticipated public perceptions. The applicant will summarize the political complexity of each project as either *Not Complex*, *Complex*, or *Very Complex* and generally justify the rating. For example, expanding an existing intake might be rated “not complex,” while implementing a direct reuse project might be rated “very complex.”

Other Public Benefits

- The applicant will discuss any secondary public benefits associated with each project. The applicant will consider such possible benefits as recreation. The applicant will summarize the public benefits as either *None*, *Few*, or *Many*.

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Costs

- Applicants will calculate the cost of an alternative as the total present worth in year 2000 dollars, including capital costs and O&M costs (operation and maintenance), from 2000 to 2050. The cost will be expressed both as a total ($) and as a unit cost ($ per 1000 gallons) for the same.
- Applicants are not required to do a detailed cost analysis for alternatives that are analyzed as unfavorable (i.e., receive the least favorable rating) for five or more criteria.

Capital Costs

- facilities and equipment
  - water supply, water supply intake, transmission to a water treatment plant, the water treatment plant, and transmission to the service area distribution system
  - (but not the distribution system within the service area).
- construction costs,
- land acquisition and directly related costs
  - justify unit costs used ($/acre)
- engineering costs,
- legal and administrative costs,
- cost of meeting regulatory requirements,
- general contingency
- annual capital cost in year 2000 dollars.

Operations & Maintenance

- labor,
- repair,
- power,
- chemicals,
- supplies,
- administration.
- 2000 dollars.

Annual Cost

- sum of
  - yearly capital costs (i.e., the total capital cost / life of the project),
  - O&M costs, and the
  - annual cost of capital recovery (i.e., the cost of repaying the debt associated with the capital costs).
- interest rate of 6% for capital recovery.[1]
- 25-year life for equipment
- 50-year life for pipelines and structures for replacement costs and salvage value.
- add the replacement costs associated with a project if the replacement occurs before 2050.
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[1] The interest rate is based on the interest rate for twenty-year, tax-exempt bonds issued by units of local government, used for planning purposes by the NC Department of State Treasurer, State and Local Government Finance Division.

Standardizing

- *Total present worth* is calculated by summing the net present value of annual costs over the 2000-2050 planning period, assuming a discount rate of 4%, less the salvage value of facilities and equipment at 2050.[1]
- *Unit costs* are expressed as an annual average. The average annual unit cost will be calculated by dividing the annual cost of each alternative in Year 2000 dollars by the related annual water demand and should be expressed in $/1000 gallons. The annual unit water costs will be calculated in 5-year increments according to expected annual deliveries for the life of the project.
- [1] The discount rate is based on an average of the inflationary factors projected for a variety of items by the Office of State Budget and Management (Instructions for Preparation of the 2001-2003 Recommended State Budget and the Biennial State Plan, April 2000, Section 5, Attachment 12).

Jordan Lake Allocation Costs

- For *Jordan Lake*, the costs of developing the proposed withdrawal should be estimated as described above. Costs will include an estimate of the required annual repayment for the allocation and costs related to developing water supply facilities such as intakes, treatment plants, transmission lines, etc. Attachment 4 includes a summary of the annual costs and repayment contracts associated with receiving an allocation from Jordan Lake. This document defines the annual payments, which include capital, operating and administrative costs for potential allocations.

Contingency

Contingency	Project Is: Not Complex or Complex	Project Is: Very Complex
Engineering Costs	.10	.20
Legal & Administrative Costs	.05	.10
Cost of Regulatory Requirements	.05	.10
General Contingency	.10	.10

Alternative Comparisons

Alternatives	Summary Description
Alternative 1	
Alternative 2	
Alternative 3	
(etc.)	

	Alternatives				
	(Example)	2	3	4	5
Total Supply (MGD)	24				
Environmental Impacts	Worse				
Water Quality Classification	WS-III				
Interbasin Transfer (MGD)	3				
Regional Partnerships	Yes				
Technical Complexity	Complex				
Institutional Complexity	Not Complex				
Political Complexity	Very Complex				
Public Benefits	Few				
Consistency with Local Plans	Yes				
Total Cost ($ Millions)	12.7				
Unit Cost ($/1000 gallons)	2.12				